



## SEQUENCE LISTING

<110> Sturmer, Rainer  
Kessler, Maria  
Hauer, Bernhard  
Friedrich, Thomas  
Breuer, Michael

<120> Methods for the production of  
3-methylamino-1-(thiene-2-yl)-propane-1-ol

<130> 13111-00035-US

<140> US/10/573,130

<141> 2006-03-23

<150> PCT/EP2004/010939

<151> 2004-09-30

<150> DE 103 45 772.0

<151> 2003-10-01

<160> 44

<170> PatentIn version 3.3

<210> 1

<211> 47

<212> PRT

<213> Lactobacillus brevis

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Leu	Gly	Ile	Gly	Leu	Ala	Ile	Ala	Thr	Lys	Phe	Val	Glu	Glu	Gly	Ala
		20					25					30			
Lys	Val	Met	Ile	Thr	Gly	Arg	His	Ser	Asp	Val	Gly	Glu	Lys	Ala	
		35				40					45				

<210> 2

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<212> PRT

<213> Candida magnoliae

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Ser Asn Ala Leu Val Thr Gly Gly Ser Arg Val Ile Gly Ala Gly Gly

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Phe Ile

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<213> Lactobacillus brevis

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Met Ser Asn Arg Leu Asp Gly Lys Val Ala Ile Val Thr Gly Gly Thr	
1 5 10 15	
ttg ggt atc ggt tta gct atc gcc acg aag ttc gtt gaa gaa ggg gct	96
Leu Gly Ile Gly Leu Ala Ile Ala Thr Lys Phe Val Glu Glu Gly Ala	
20 25 30	
aag gtc atg att acc ggc cgg cac agc gat gtt ggt gaa aaa gca gct	144
Lys Val Met Ile Thr Gly Arg His Ser Asp Val Gly Glu Lys Ala Ala	
35 40 45	
aag agt gtc ggc act cct gat cag att caa ttt ttc caa cat gat tct	192
Lys Ser Val Gly Thr Pro Asp Gln Ile Gln Phe Phe Gln His Asp Ser	
50 55 60	
tcc gat gaa gac ggc tgg acg aaa tta ttc gat gca acg gaa aaa gcc	240
Ser Asp Glu Asp Gly Trp Thr Lys Leu Phe Asp Ala Thr Glu Lys Ala	
65 70 75 80	
ttt ggc cca gtt tct aca tta gtt aat aac gct ggg atc gcg gtt aac	288
Phe Gly Pro Val Ser Thr Leu Val Asn Asn Ala Gly Ile Ala Val Asn	
85 90 95	
aag agt gtc gaa gaa acc acg act gct gaa tgg cgt aaa cta tta gcc	336
Lys Ser Val Glu Glu Thr Thr Thr Ala Glu Trp Arg Lys Leu Leu Ala	
100 105 110	
gtc aac ctt gat ggt gtc ttc ttc ggt acc cga tta ggg att caa cgg	384
Val Asn Leu Asp Gly Val Phe Phe Gly Thr Arg Leu Gly Ile Gln Arg	
115 120 125	
atg aag aac aaa ggc tta ggg gct tcc atc atc aac atg tct tcg atc	432
Met Lys Asn Lys Gly Leu Gly Ala Ser Ile Ile Asn Met Ser Ser Ile	
130 135 140	
gaa ggc ttt gtg ggt gat cct agc tta ggg gct tac aac gca tct aaa	480
Glu Gly Phe Val Gly Asp Pro Ser Leu Gly Ala Tyr Asn Ala Ser Lys	
145 150 155 160	
ggg gcc gta cgg att atg tcc aag tca gct gcc tta gat tgt gcc cta	528
Gly Ala Val Arg Ile Met Ser Lys Ser Ala Ala Leu Asp Cys Ala Leu	
165 170 175	
aag gac tac gat gtt cgg gta aac act gtt cac cct ggc tac atc aag	576
Lys Asp Tyr Asp Val Arg Val Asn Thr Val His Pro Gly Tyr Ile Lys	
180 185 190	

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aca cca ttg gtt gat gac cta cca ggg gcc gaa gaa gcg atg tca caa      624
Thr Pro Leu Val Asp Asp Leu Pro Gly Ala Glu Glu Ala Met Ser Gln
      195                200                205
cgg acc aag acg cca atg ggc cat atc ggt gaa cct aac gat att gcc      672
Arg Thr Lys Thr Pro Met Gly His Ile Gly Glu Pro Asn Asp Ile Ala
      210                215                220
tac atc tgt gtt tac ttg gct tct aac gaa tct aaa ttt gca acg ggt      720
Tyr Ile Cys Val Tyr Leu Ala Ser Asn Glu Ser Lys Phe Ala Thr Gly
      225                230                235                240
tct gaa ttt gta gtt gac ggt ggc tac act gct caa      756
Ser Glu Phe Val Val Asp Gly Gly Tyr Thr Ala Gln
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<210> 4

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<213> Lactobacillus brevis

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Met Ser Asn Arg Leu Asp Gly Lys Val Ala Ile Val Thr Gly Gly Thr
1      5      10      15
Leu Gly Ile Gly Leu Ala Ile Ala Thr Lys Phe Val Glu Glu Gly Ala
      20      25      30
Lys Val Met Ile Thr Gly Arg His Ser Asp Val Gly Glu Lys Ala Ala
      35      40      45
Lys Ser Val Gly Thr Pro Asp Gln Ile Gln Phe Phe Gln His Asp Ser
      50      55      60
Ser Asp Glu Asp Gly Trp Thr Lys Leu Phe Asp Ala Thr Glu Lys Ala
      65      70      75      80
Phe Gly Pro Val Ser Thr Leu Val Asn Asn Ala Gly Ile Ala Val Asn
      85      90      95
Lys Ser Val Glu Glu Thr Thr Thr Ala Glu Trp Arg Lys Leu Leu Ala
      100     105     110
Val Asn Leu Asp Gly Val Phe Phe Gly Thr Arg Leu Gly Ile Gln Arg
      115     120     125
Met Lys Asn Lys Gly Leu Gly Ala Ser Ile Ile Asn Met Ser Ser Ile
      130     135     140
Glu Gly Phe Val Gly Asp Pro Ser Leu Gly Ala Tyr Asn Ala Ser Lys
      145     150     155     160
Gly Ala Val Arg Ile Met Ser Lys Ser Ala Ala Leu Asp Cys Ala Leu
      165     170     175
Lys Asp Tyr Asp Val Arg Val Asn Thr Val His Pro Gly Tyr Ile Lys
      180     185     190
Thr Pro Leu Val Asp Asp Leu Pro Gly Ala Glu Glu Ala Met Ser Gln
      195     200     205
Arg Thr Lys Thr Pro Met Gly His Ile Gly Glu Pro Asn Asp Ile Ala
      210     215     220
Tyr Ile Cys Val Tyr Leu Ala Ser Asn Glu Ser Lys Phe Ala Thr Gly
      225     230     235     240
Ser Glu Phe Val Val Asp Gly Gly Tyr Thr Ala Gln
                245                250

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att aag ctc gcc gag gag ggc tac agc gtc acg att gcg tct cgc ggc      96
Ile Lys Leu Ala Glu Glu Gly Tyr Ser Val Thr Ile Ala Ser Arg Gly
          20          25          30
ctt aag cag ctc gag gct gtg aag gcc aaa cta ccc att gtg aag cag      144
Leu Lys Gln Leu Glu Ala Val Lys Ala Lys Leu Pro Ile Val Lys Gln
          35          40          45
gga cag gtt cac cac gtg tgg cag ctt gat ctc agt gat gtc gac gct      192
Gly Gln Val His His Val Trp Gln Leu Asp Leu Ser Asp Val Asp Ala
          50          55          60
gcg gcc gcc ttc aaa ggg tcg ccg cta cct gcc agc cgc tac gac gtg      240
Ala Ala Ala Phe Lys Gly Ser Pro Leu Pro Ala Ser Arg Tyr Asp Val
65          70          75          80
ctc gtc agc aat gct ggc gtg gcc cag ttt agc ccg ttc atc gag cat      288
Leu Val Ser Asn Ala Gly Val Ala Gln Phe Ser Pro Phe Ile Glu His
          85          90          95
gcg aag cag gac tgg tcg cag atg ctt gcc atc aat ctg gcg gca ccc      336
Ala Lys Gln Asp Trp Ser Gln Met Leu Ala Ile Asn Leu Ala Ala Pro
          100          105          110
att gcg ctg gcc cag aca ttt gct aag gcc att ggc gac aag ccg cgc      384
Ile Ala Leu Ala Gln Thr Phe Ala Lys Ala Ile Gly Asp Lys Pro Arg
          115          120          125
aac aca ccg gcc cac att gtg ttt gtc tcg tcg aac gtc tcg ttg cga      432
Asn Thr Pro Ala His Ile Val Phe Val Ser Ser Asn Val Ser Leu Arg
          130          135          140
ggc ttc ccg aac atc ggc gtc aac tcc atc acc ccc ggc a      472
Gly Phe Pro Asn Ile Gly Val Asn Ser Ile Thr Pro Gly
145          150          155

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<210> 6

<211> 157

<212> PRT

<213> *Candida magnoliae*

&lt;400&gt; 6

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Asn Ala Leu Val Thr Gly Gly Ser Arg Gly Ile Gly Glu Ala Thr Ala
1      5      10      15
Ile Lys Leu Ala Glu Glu Gly Tyr Ser Val Thr Ile Ala Ser Arg Gly
20     25     30
Leu Lys Gln Leu Glu Ala Val Lys Ala Lys Leu Pro Ile Val Lys Gln
35     40     45
Gly Gln Val His His Val Trp Gln Leu Asp Leu Ser Asp Val Asp Ala
50     55     60
Ala Ala Ala Phe Lys Gly Ser Pro Leu Pro Ala Ser Arg Tyr Asp Val
65     70     75     80
Leu Val Ser Asn Ala Gly Val Ala Gln Phe Ser Pro Phe Ile Glu His
85     90     95
Ala Lys Gln Asp Trp Ser Gln Met Leu Ala Ile Asn Leu Ala Ala Pro
100    105    110
Ile Ala Leu Ala Gln Thr Phe Ala Lys Ala Ile Gly Asp Lys Pro Arg
115    120    125
Asn Thr Pro Ala His Ile Val Phe Val Ser Ser Asn Val Ser Leu Arg
130    135    140
Gly Phe Pro Asn Ile Gly Val Asn Ser Ile Thr Pro Gly
145    150    155

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&lt;210&gt; 7

&lt;211&gt; 27

&lt;212&gt; DNA

&lt;213&gt; Artificial sequence

&lt;220&gt;

&lt;223&gt; Primer: Mke 338

&lt;400&gt; 7

gggaattcca tatgtctaac cgtttgg

27

&lt;210&gt; 8

&lt;211&gt; 28

&lt;212&gt; DNA

&lt;213&gt; Artificial sequence

&lt;220&gt;

&lt;223&gt; Primer: Mke 339

&lt;400&gt; 8

cgtagggaag cttattgagc agtgtagc

28

&lt;210&gt; 9

&lt;211&gt; 28

&lt;212&gt; DNA

&lt;213&gt; Artificial sequence

&lt;220&gt;

&lt;223&gt; Primer: Mke 366

&lt;400&gt; 9

acgacgacga gcaacgcbct bgtbacgg 28

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Phe Val Val Asp Gly Gly Tyr Thr Ala Gln  
 1 5 10

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Ser Thr Thr Ser Asn Ala Leu Val Thr Gly Gly Ser Arg Gly Ile Gly  
1 5 10 15

Ala Ala

<210> 14

<211> 9

<212> PRT

<213> *Candida magnoliae*

<400> 14

Ile Gly Val Asn Ser Ile Asn Pro Gly  
1 5

<210> 15

<211> 60

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<222> (60)..(60)

<223> Xaa is unknown

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Ser Asn Arg Leu Asp Gly Lys Val Ala Ile Val Thr Gly Gly Thr Leu  
1 5 10 15

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Gly Ile Gly Leu Ala Ile Ala Thr Lys Phe Val Glu Glu Gly Ala Lys
      20              25              30
Val Met Ile Thr Gly Arg His Ser Asp Val Gly Glu Lys Ala Ala Lys
      35              40              45
Ser Val Gly Thr Pro Asp Gln Ile Gln Phe Phe Xaa
      50              55              60

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<210> 16
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<213> Lactobacillus brevis

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<223> Amino acid is Pro, Val, or Ala

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<223> Amino acid is Leu, Gly, or Thr

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<220>  
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Thr	Pro	Leu	Val	Asp	Asp	Leu	Pro	Gly	Ala	Glu	Glu	Ala	Met	Ser	Gln
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Arg	Arg	Xaa	Xaa												
			20												

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 <223> Xaa is unknown

<400> 17

Ser	Val	Glu	Glu	Thr	Thr	Thr	Ala	Glu	Trp	Arg	Xaa	Xaa	Xaa	Xaa
1				5					10					15

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 <223> Xaa is J

<400> 18

Ser	Val	Gly	Thr	Pro	Asp	Gln	Xaa	Gln	Phe	Phe	Gln	His	Asp	Ser	Ser
1				5					10					15	

Asp	Glu	Asp	Gly												
			20												

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 <223> Amino acid is Val or Ala

<220>  
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 <223> Amino acid is Lys or unknown

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 <222> (11)..(15)  
 <223> Xaa is unknown

<400> 19

Val	Asn	Thr	Val	His	Pro	Gly	Tyr	Xaa	Lys	Xaa	Xaa	Xaa	Xaa	Xaa
1			5						10					15

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Val Asn Thr Val

1

<210> 21

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<213> Lactobacillus brevis

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<220>

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<400> 21

Ala Phe Ile Pro Gly Lys Arg

1

5

<210> 22

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<400> 22

Ser	Ala	Ala	Leu	Asp	Xaa	Ala	Leu	Lys	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa
1				5					10					15

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<223> Amino acid is Ala or Phe

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<400> 23

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Ser Ala Ala Leu Asp Xaa Ala Leu Lys Asp Tyr Xaa Val Arg Xaa Xaa
1          5          10          15
Xaa Xaa

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<210> 24  
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<220>  
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 <222> (6)..(6)  
 <223> Xaa is unknown

<220>  
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 <222> (10)..(17)  
 <223> Xaa is unknown

<400> 24

Ser Ala Ala Leu Asp Xaa Ala Leu Lys Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
 1 5 10 15  
 Xaa

<210> 25  
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<220>  
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<400> 25

Lys Leu Leu Ala Val Asn Leu Asp Gly Val Phe Phe Gly Thr Arg Xaa  
 1 5 10 15  
 Xaa Xaa Xaa Xaa  
 20

<210> 26  
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<400> 26

Xaa Met Xaa Thr Gly Arg  
1 5

<210> 27

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<220>

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<222> (8)..(8)

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<220>

<221> MISC\_FEATURE

<222> (9)..(9)

<223> Xaa is unknown, Lys, or Val



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<220>
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<220>
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<223> Amino acid is Ala or unknown

<400> 27

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Thr Lys Thr Pro Met Gly His Ile Xaa Glu Pro Asn Xaa Ile Ala
1           5           10           15

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<210> 28
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Thr	Lys	Thr	Pro	Met	Gly	Xaa	Ile	Ala	Glu	Pro	Asn	Asp	Ile	Ala	Tyr
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Xaa	Xaa	Xaa	Xaa												
				20											

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Lys	Ala	Ala	Lys	Ser	Val	Gly	Thr	Pro	Asp	Gln	Ile	Gln	Phe	Phe	Gln
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His	Asp	Ser	Ser	Pro	Glu	Val	Val	Gln							
			20					25							

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Xaa Val Lys Leu Leu Ala Val Asn Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa
1          5          10          15
Xaa Xaa Xaa Xaa
                20

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Thr Val Phe Phe Gly Leu Lys Gln Asn Ile Glu Asn Ile Asn Ile Ala  
1 5 10 15  
Ala Val Arg Pro  
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Gly	Phe	Val	Gly	Asp	Pro	Ser	Leu	Gly	Ala	Tyr	Asn	Ala	Gly	Lys	Gly
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Ala	Val	Arg	Ile	Met	Ser	Lys	Ser	Ala	Ala	Leu	Asp	Xaa	Xaa		
			20					25						30	

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Phe Val Val Asp Xaa Xaa Xaa Xaa Xaa Xaa  
 1 5 10

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Asp	Gly	Xaa	Thr	Lys	Leu	Phe	Asp	Ala	Thr	Glu	Glu	Xaa	Xaa	Xaa	Xaa
1				5					10					15	
Xaa	Xaa	Xaa	Xaa												
				20											

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Phe	Val	Val	Asp	Gly	Gly	Tyr	Thr	Ala	Gln	Xaa	Xaa	Xaa	Xaa
1				5					10				

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Xaa	Ala	Leu	Lys	Asp	Tyr	Asp	Val	Arg	Val	Asn	Thr	Val	His	Pro	Gly
1			5					10						15	
Tyr	Ile	Lys	Thr	Pro	Leu	Val	Val	Asp	Leu	Pro	Gly	Ala	Glu		
			20					25					30		

<210> 37  
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<400> 37

Lys	Ala	Ala	Lys	Ser	Val	Gly	Thr	Pro	Asp	Gln	Ile	Gln	Phe	Phe
1			5					10					15	

<210> 38  
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 <212> PRT  
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<400> 38

Gly	Ala	Lys	Val	Met	Ile	Thr	Gly	Arg	His	Ser	Asp	Val
1			5					10				

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Ser Lys Phe Ala Thr Gly Ser Glu Phe Val

1

5

10

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Xaa	Asp	Val	Arg	Val	Asn	Thr	Val	His	Pro	Gly	Tyr	Ile	Lys	Thr	Pro
1				5					10					15	
Leu	Val	Asp	Asp	Leu	Pro	Gly	Ala	Glu							
				20				25							

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<400> 41

Trp	Xaa	Lys	Leu	Leu	Ala	Val	Asn	Leu	Asp	Gly	Val	Phe	Phe	Gly	Thr
1				5					10					15	
Arg	Leu	Gly	Ile	Gln	Arg	Met	Lys	Asn	Lys	Gly	Leu	Gly	Ala	Ser	Ile
			20					25					30		
Ile	Asn	Met	Ser	Ser	Ile	Xaa	Xaa								
			35				40								

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<400> 42

Ala	Met	Ser	Gln	Arg	Thr	Lys	Thr	Pro	Met	Gly	His	Ile	Gly	Glu	Pro
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Asn	Asp	Ile	Ala	Tyr	Arg	Met	Lys	Tyr	Lys	Ala	Leu	Gly	Ala	Ser	Ile
		20					25					30			
Ile	Asn	Met	Ser	Xaa	Xaa	Xaa	Gly								
	35					40									

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 <213> Lactobacillus brevis

<220>  
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<400> 43

Ser	Lys	Phe	Ala	Thr	Gly	Ser	Glu	Phe	Val	Val	Xaa	Xaa	Xaa	Xaa
1			5					10					15	

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<400> 44

Ser	Lys	Phe	Ala	Thr	Gly	Ser	Glu	Phe	Val	Val	Asp	Xaa	Xaa	Xaa
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